



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/NO91/00153</p> <p>(22) International Filing Date: 5 December 1991 (05.12.91)</p> <p>(30) Priority data: 905316 7 December 1990 (07.12.90) NO</p> <p>(71) Applicant (for all designated States except US): NORDIC TECHNOLOGY A.S. [NO/NO]; P.O. Box 101, N-1361 Billingstadsletta (NO).</p> <p>(72) Inventor; and</p> <p>(75) Inventor/Applicant (for US only) : SØMBORG, Tom [NO/NO]; Tverråsen 5, N-1315 Nesøya (NO).</p> <p>(74) Agent: TANDBERGS PATENTKONTOR AS; Postboks 7085 H, N-0306 Oslo (NO).</p>		<p>(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CI (OAPI patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GN (OAPI patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC (European patent), MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, PL, RO, SD, SE, SE (European patent), SN (OAPI patent), SU<sup>+</sup>, TD (OAPI patent), TG (OAPI patent), US.</p> <p><b>Published</b> <i>With international search report.</i></p>	
<p>(54) Title: PORTABLE SMOKE ALARM</p> <p>(57) Abstract</p> <p>Portable smoke alarm device comprising a smoke sensor and a battery powered alarm clock, the alarm device comprising a main unit to which a sensor unit may be releasably secured, the sensor unit thereby comprising a smoke detector, a signal transmitter for wireless transmission of signals to the main unit when detecting smoke, the sensor unit being designed for easy detachment near the ceiling of a room such as to a curtain, the main unit comprising an alarm clock, an alarm transmitter or buzzer, a receiver for the receipt of signals from the sensor unit and a battery powering the alarm clock and the buzzer, the main unit furthermore comprising a sensor or switch responsive to whether or not the main unit rests on a surface and a further sensor or switch or switch responsive to whether or not the sensor unit is secured to the main unit, the alarm clock buzzer thereby being activated if the main unit is lifted from the surface without the sensor unit being secured to it.</p>			

+ DESIGNATIONS OF "SU"

Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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Portable smoke alarm

5 The present invention is related to a portable smoke alarm according to the preamble of the claims.

Portable smoke alarms, especially indented for use when travelling, are commercially available in an number of different designs. One of the problems connected with such smoke alarms, 10 however, is that travelling persons often leave the alarm behind them when leaving a place. The alarm as such is part of a number of subjects to be packed before leaving, often in a hurry.

Another problem with such portable alarms, an more serious, is that they usually are placed on a bed side table or 15 such, approximately at the same elevation as the user's head. The smoke alarm therefore does not detect smoke where it first is collected in the room, namely near the ceiling. A danger therefore exists that the alarm is activated too late as the person already may be unconscious as the area around the user may 20 have had smoke for a period of time.

For portable smoke alarms it is essential, as is also for stationary ones, that the battery continuously is checked out and possibly replaced. Known portable smoke alarms do have no build in incentive to control the battery each time the alarm is 25 taken into use.

The above mentioned disadvantages in connection with known portable smoke alarms limit their reliability which may be one reason why they are not seen more commonly in use.

It therefore is an object for the present invention to 30 provide a portable smoke alarm without the above mentioned disadvantages, which ensures that the sensor registers smoke where the smoke first will be collected, namely near the ceiling, which furthermore ensures that the battery continuously is controlled and possibly replaced and above all which ensures that 35 the user does not forget the smoke alarm when leaving the place.

These objects are achieved with the portable smoke alarm according to the present invention as described by the features stated of the claims.

The portable smoke alarm according to the present

invention comprises one main unit and one sensor unit. The two units are arranged separately during use, however connected to each other to one unit when not in use. The main unit comprises a battery powered alarm clock and suitably also is designed to 5 be used as a flash light. It furthermore comprises a receiver for wireless transmission of signals from the sensor unit. The main unit further comprises an alarm unit connected with the receiver which, when receiving signals from the receiver unit, activates an alarm which may be the buzzer of the alarm clock.

10 The flash light which is build into the main unit, the alarm clock and the receiver unit are all connected with the battery in the main unit which the user will ensure to be intact to be able to use the alarm clock.

15 The sensor unit comprises a smoke sensor, a battery and a transmitter, preferably for transmitting infrared beams to the main unit when detecting smoke. Preferably an optical sensor is used. The sensor unit may further comprise a buzzer to be activated shortly when the sensor unit is removed from the main unit in case the battery is still intact.

20 The sensor unit is provided with a clamp, a hook, lock or such, thereby making it easy to secure the unit as close to the sealing as possible, such as on curtains or other places.

25 The sensor unit is to be secured to the main unit after use, by snapping, clamping, by means of a magnet or such. When the sensor unit is removed from the main unit, the buzzer is activated a short moment to indicate that the battery in the sensor unit is intact. In this way it is ensured that the user, before use of the alarm, has controlled that the battery is intact and he may possibly replace the battery with a new battery 30 if the buzzer is not activated.

It further is of importance to ensure that the user is leaving the place without both the main unit and the sensor unit. Therefore the main unit is such designed that the buzzer is activated in case the main unit is lifted from a table or such 35 without having the sensor unit secured to it. This may be achieved for example by arranging in the main unit a sensor or micro switch registration that the main unit is resting on a surface and a further sensor or micro switch registration whether or not the sensor unit is secured to the main unit.

When lifting the main unit without the sensor unit from a table or such, the buzzer in the main unit is activated until the sensor unit is secured to the main unit or the main unit is placed on a surface.

Patent Claims

5        1. Portable smoke alarm device comprising a smoke sensor and a battery powered alarm clock, CHARACTERIZED BY the alarm device comprising a main unit to which a sensor unit may be releasably secured, the sensor unit thereby comprising a smoke detector, a signal transmitter for wireless transmission of 10 signals to the main unit when detecting smoke, the sensor unit being designed for easy detachment near the sealing of a room such as to a curtain, the main unit comprising an alarm clock, an alarm transmitter or buzzer, a receiver for the receipt of signals from the sensor unit and a battery powering the alarm 15 clock and the buzzer, the main unit furthermore comprising a sensor or switch responsive to whether or not the main unit rests on a surface and a further sensor or switch responsive to whether or not the sensor unit is secured to the main unit, the alarm clock buzzer thereby being activated if the main unit is lifted 20 from the surface without the sensor unit being secured to it.

2. Smoke alarm device according to claim 1, CHARACTERIZED IN the sensor unit being releasably connected with the main unit by means of clamping connections, magnets or such.

3. Smoke alarm device according to claims 1-2, CHARACTERIZED IN the sensor unit being releasably connectable to subjects such as curtains, curtain rods or such by means of for example a lock, a hook, clamp, magnet or such arranged on the sensor unit.

4. Smoke alarm device according to claims 1-3, CHARACTERIZED IN a buzzer being arranged in the sensor unit and being activated for a short period of time when the sensor unit is removed from the main unit, thereby to signal that the battery still in intact.

5. Smoke alarm device according to claims 1-4, CHARACTERIZED IN the main unit also comprising a flash light powered by the main unit battery.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/NO 91/00153

## I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all)<sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC  
IPC5: G 08 B 17/10, G 04 B 47/00

## II. FIELDS SEARCHED

Minimum Documentation Searched<sup>7</sup>

Classification System	Classification Symbols
IPC5	G 08 B, G 04 B

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in Fields Searched<sup>8</sup>

SE,DK,FI,NO classes as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup>

Category <sup>10</sup>	Citation of Document <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	US, A, 4611200 (FRED W. STILWELL) 9 September 1986, see column 2, line 54 - column 3, line 45; abstract --	1-5
A	US, A, 4480250 (CHARLES D. MCNEELY) 30 October 1984, see abstract --	1-5
A	US, A, 4369435 (YASABURO ADACHI ET AL) 18 January 1983, see column 3, line 36 - line 64; abstract --	1-5
A	US, A, 4949077 (DAVID G. MBUTHIA) 14 August 1990, see column 2, line 19 - line 26 -- -----	5

\* Special categories of cited documents:<sup>10</sup>

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"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search

20th March 1992

Date of Mailing of this International Search Report

1992-03-23

International Searching Authority

Signature of Authorized Officer

SWEDISH PATENT OFFICE

STEFAN SVAHN

ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.PCT/NO 91/00153

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
The members are as contained in the Swedish Patent Office EDP file on 28/02/92.  
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 4611200	86-09-09	NONE		
US-A- 4480250	84-10-30	NONE		
US-A- 4369435	83-01-18	AT-B-	388060	89-04-25
		AU-B-	533234	83-11-10
		AU-D-	6060680	81-01-29
		CH-A-B-	659334	87-01-15
		DE-A-	3028395	81-02-12
		FR-A-B-	2462749	81-02-13
		GB-A-B-	2055236	81-02-25
		JP-A-	56021294	81-02-27
		JP-B-	59005955	84-02-08
US-A- 4949077	90-08-14	GB-A-	2236607	91-04-10
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